

SEQUENCE LISTING

<110> Ostermann, Kai
Rodel, Gerhard

<120> SECRETION OF PROTEINS FROM YEASTS

<130> 13111-00033-US

<150> PCT/EP2004/010346

<151> 2004-09-15

<150> DE 103 42 794.5

<151> 2003-09-16

<160> 56

<170> PatentIn version 3.3

<210> 1

<211> 171

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1)..(171)

<400> 1

atg	aag	atc	acc	gct	gtc	att	gcc	ctt	tta	ttc	tca	ctt	gct	gct	gcc	48
Met	Lys	Ile	Thr	Ala	Val	Ile	Ala	Leu	Leu	Phe	Ser	Leu	Ala	Ala	Ala	
1				5				10					15			

tca	cct	att	cca	gtt	gcc	gat	cct	ggg	gtg	gtt	tca	gtt	agc	aag	tca	96
Ser	Pro	Ile	Pro	Val	Ala	Asp	Pro	Gly	Val	Val	Ser	Val	Ser	Lys	Ser	
			20					25					30			

tat	gct	gat	ttc	ctt	cgt	gtt	tac	caa	agt	tgg	aac	act	ttt	gct	aat	144
Tyr	Ala	Asp	Phe	Leu	Arg	Val	Tyr	Gln	Ser	Trp	Asn	Thr	Phe	Ala	Asn	
		35					40					45				

cct	gat	aga	ccc	aac	ttg	aaa	aag	cgc								171
Pro	Asp	Arg	Pro	Asn	Leu	Lys	Lys	Arg								
		50					55									

<210> 2

<211> 57

<212> PRT

<213> Schizosaccharomyces pombe

<400> 2

Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1 5 10 15

Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
20 25 30

Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
35 40 45

Pro Asp Arg Pro Asn Leu Lys Lys Arg
50 55

<210> 3

<211> 60

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1) .. (60)

<220>

<221> sig_peptide

<222> (1) .. (60)

<400> 3

atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc 48
Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
1 5 10 15

tca cct att cca 60
Ser Pro Ile Pro
20

<210> 4

<211> 20

<212> PRT

<213> Schizosaccharomyces pombe

<400> 4

Met	Lys	Ile	Thr	Ala	Val	Ile	Ala	Leu	Leu	Phe	Ser	Leu	Ala	Ala	Ala
1				5				10					15		

Ser	Pro	Ile	Pro
			20

<210> 5

<211> 81

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1)..(81)

<400> 5

aag	tca	tat	gct	gat	ttc	ctt	cgt	gtt	tac	caa	agt	tgg	aac	act	ttt	48
Lys	Ser	Tyr	Ala	Asp	Phe	Leu	Arg	Val	Tyr	Gln	Ser	Trp	Asn	Thr	Phe	
1				5				10					15			

gct	aat	cct	gat	aga	ccc	aac	ttg	aaa	aag	cgc	81
Ala	Asn	Pro	Asp	Arg	Pro	Asn	Leu	Lys	Lys	Arg	
			20				25				

<210> 6

<211> 27

<212> PRT

<213> Schizosaccharomyces pombe

<400> 6

Lys Ser Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe
 1 5 10 15

Ala Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg
 20 25

<210> 7

<211> 78

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1)..(78)

<220>

<221> sig_peptide

<222> (1)..(60)

<400> 7
 atg aag atc acc gct gtc att gcc ctt tta ttc tca ctt gct gct gcc 48
 Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
 1 5 10 15

tca cct att cca gtt gcc gat cct ggt gtg 78
 Ser Pro Ile Pro Val Ala Asp Pro Gly Val
 20 25

<210> 8

<211> 26

<212> PRT

<213> Schizosaccharomyces pombe

<400> 8

Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala

act ttt gtt aat cct gac aga ccc aac ttg aaa aag cgc gaa ttc gaa 384
Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu
115 120 125

gct gct ccc gca aaa act tat gct gat ttc ctt cgt gct tac caa agt 432
 Ala Ala Pro Ala Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser
 130 135 140

tgg aac act ttt gtt aat cct gac aga ccc aac ttg aaa aag cgc act 480
 Trp Asn Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Thr
 145 150 155 160

gaa gaa gat gaa gag aat gag gaa gag gat gaa gaa tac tat cgc ttt 528
 Glu Glu Asp Glu Glu Asn Glu Glu Glu Asp Glu Glu Tyr Tyr Arg Phe
 165 170 175

ctt cag ttt tat atc atg act gtc cca gag aat tcc act att aca gat 576
 Leu Gln Phe Tyr Ile Met Thr Val Pro Glu Asn Ser Thr Ile Thr Asp
 180 185 190

gtc aat att act gcc aaa ttt gag agc taa 606
 Val Asn Ile Thr Ala Lys Phe Glu Ser
 195 200

<210> 10

<211> 201

<212> PRT

<213> Schizosaccharomyces pombe

<400> 10

Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
 1 5 10 15

Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
 20 25 30

Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
 35 40 45

Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala Pro Ala
 50 55 60

Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser Trp Asn Thr Phe
 65 70 75 80

Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu Ala Ala
 85 90 95

Pro Glu Lys Ser Tyr Ala Asp Phe Leu Arg Ala Tyr His Ser Trp Asn
 100 105 110

Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Glu Phe Glu
 115 120 125

Ala Ala Pro Ala Lys Thr Tyr Ala Asp Phe Leu Arg Ala Tyr Gln Ser
 130 135 140

Trp Asn Thr Phe Val Asn Pro Asp Arg Pro Asn Leu Lys Lys Arg Thr
 145 150 155 160

Glu Glu Asp Glu Glu Asn Glu Glu Glu Asp Glu Glu Tyr Tyr Arg Phe
 165 170 175

Leu Gln Phe Tyr Ile Met Thr Val Pro Glu Asn Ser Thr Ile Thr Asp
 180 185 190

Val Asn Ile Thr Ala Lys Phe Glu Ser
 195 200

<210> 11

<211> 156

<212> DNA

<213> Unknown

<220>

<223> to be completed

<220>

<221> CDS

<222> (1) .. (156)

<400> 11

ctg gtt ccg cgt gga tcc atc gaa ggt cgt ggc ggc cgc atc ttt tac
 Leu Val Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr
 1 5 10 15

cca tac gat gtt cct gac tat gcg ggc tat ccc tat gac gtc ccg gac 96
 Pro Tyr Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp
 20 25 30

tat gca gga tcc tat cca tat gac gtt cca gat tac gct gct cag tgc 144
 Tyr Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys
 35 40 45

ggc cgc taa tag 156
 Gly Arg
 50

<210> 12

<211> 50

<212> PRT

<213> Unknown

<220>

<223> to be completed

<400> 12

Leu Val Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr
 1 5 10 15

Pro Tyr Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp
 20 25 30

Tyr Ala Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys
 35 40 45

Gly Arg
 50

<210> 13

<211> 354

<212> DNA

<213> Aspergillus nidulans

<220>

<221> CDS

<222> (1)..(354)

<400> 13

ctc	ccg	gcc	tct	gcc	gca	aag	aac	gcg	aag	ctg	gcc	acc	tcg	gcg	gcc	48
Leu	Pro	Ala	Ser	Ala	Ala	Lys	Asn	Ala	Lys	Leu	Ala	Thr	Ser	Ala	Ala	
1				5				10				15				

ttc	gcc	aag	cag	gct	gaa	ggc	acc	acc	tgc	aat	gtc	ggc	tcg	atc	gct	96
Phe	Ala	Lys	Gln	Ala	Glu	Gly	Thr	Thr	Cys	Asn	Val	Gly	Ser	Ile	Ala	
			20				25					30				

tgc	tgc	aac	tcc	ccc	gct	gag	acc	aac	aac	gac	agt	ctg	ttg	agc	ggt	144
Cys	Cys	Asn	Ser	Pro	Ala	Glu	Thr	Asn	Asn	Asp	Ser	Leu	Leu	Ser	Gly	
		35				40					45					

ctg	ctc	ggt	gct	ggc	ctt	ctc	aac	ggg	ctc	tcg	ggc	aac	act	ggc	agc	192
Leu	Leu	Gly	Ala	Gly	Leu	Leu	Asn	Gly	Leu	Ser	Gly	Asn	Thr	Gly	Ser	
	50				55						60					

gcc	tgc	gcc	aag	gcg	agc	ttg	att	gac	cag	ctg	ggt	ctg	ctc	gct	ctc	240
Ala	Cys	Ala	Lys	Ala	Ser	Leu	Ile	Asp	Gln	Leu	Gly	Leu	Leu	Ala	Leu	
65				70				75						80		

gtc	gac	cac	act	gag	gaa	ggc	ccc	gtc	tgc	aag	aac	atc	gtc	gct	tgc	288
Val	Asp	His	Thr	Glu	Glu	Gly	Pro	Val	Cys	Lys	Asn	Ile	Val	Ala	Cys	
			85					90					95			

tgc	cct	gag	gga	acc	acc	aac	tgt	gtt	gcc	gtc	gac	aac	gct	ggc	gcc	336
Cys	Pro	Glu	Gly	Thr	Thr	Asn	Cys	Val	Ala	Val	Asp	Asn	Ala	Gly	Ala	
		100					105						110			

ggt	acc	aag	gct	gag	taa											354
Gly	Thr	Lys	Ala	Glu												
		115														

<210> 14

<211> 117

<212> PRT

<213> *Aspergillus nidulans*

<400> 14

Leu	Pro	Ala	Ser	Ala	Ala	Lys	Asn	Ala	Lys	Leu	Ala	Thr	Ser	Ala	Ala
1				5				10						15	

Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser Ile Ala
 20 25 30

Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu Ser Gly
 35 40 45

Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr Gly Ser
 50 55 60

Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu Ala Leu
 65 70 75 80

Val Asp His Thr Glu Glu Gly Pro Val Cys Lys Asn Ile Val Ala Cys
 85 90 95

Cys Pro Glu Gly Thr Thr Asn Cys Val Ala Val Asp Asn Ala Gly Ala
 100 105 110

Gly Thr Lys Ala Glu
 115

<210> 15

<211> 408

<212> DNA

<213> *Aspergillus nidulans*

<220>

<221> CDS

<222> (1) .. (408)

<400> 15

atg	cgc	ttc	atc	gtc	tct	ctc	ctc	gcc	ttc	act	gcc	gcg	gcc	acc	gca	48
Met	Arg	Phe	Ile	Val	Ser	Leu	Leu	Ala	Phe	Thr	Ala	Ala	Ala	Thr	Ala	
1				5				10					15			

acc	gcc	ctc	ccg	gcc	tct	gcc	gca	aag	aac	gcg	aag	ctg	gcc	acc	tcg	96
Thr	Ala	Leu	Pro	Ala	Ser	Ala	Ala	Lys	Asn	Ala	Lys	Leu	Ala	Thr	Ser	
			20					25				30				

gcg	gcc	ttc	gcc	aag	cag	gct	gaa	ggc	acc	acc	tgc	aat	gtc	ggc	tcg	144
Ala	Ala	Phe	Ala	Lys	Gln	Ala	Glu	Gly	Thr	Thr	Cys	Asn	Val	Gly	Ser	

35					40					45							
atc	gct	tgc	tgc	aac	tcc	ccc	gct	gag	acc	aac	aac	gac	agt	ctg	ttg	192	
Ile	Ala	Cys	Cys	Asn	Ser	Pro	Ala	Glu	Thr	Asn	Asn	Asp	Ser	Leu	Leu		
50					55					60							
agc	ggt	ctg	ctc	ggt	gct	ggc	ctt	ctc	aac	ggg	ctc	tcg	ggc	aac	act	240	
Ser	Gly	Leu	Leu	Gly	Ala	Gly	Leu	Leu	Asn	Gly	Leu	Ser	Gly	Asn	Thr		
65					70					75					80		
ggc	agc	gcc	tgc	gcc	aag	gcg	agc	ttg	att	gac	cag	ctg	ggt	ctg	ctc	288	
Gly	Ser	Ala	Cys	Ala	Lys	Ala	Ser	Leu	Ile	Asp	Gln	Leu	Gly	Leu	Leu		
85					90					95							
gct	ctc	gtc	gac	cac	act	gag	gaa	ggc	ccc	gtc	tgc	aag	aac	atc	gtc	336	
Ala	Leu	Val	Asp	His	Thr	Glu	Glu	Gly	Pro	Val	Cys	Lys	Asn	Ile	Val		
100					105					110							
gct	tgc	tgc	cct	gag	gga	acc	acc	aac	tgt	gtt	gcc	gtc	gac	aac	gct	384	
Ala	Cys	Cys	Pro	Glu	Gly	Thr	Thr	Asn	Cys	Val	Ala	Val	Asp	Asn	Ala		
115					120					125							
ggc	gcc	ggt	acc	aag	gct	gag	taa									408	
Gly	Ala	Gly	Thr	Lys	Ala	Glu											
130					135												

<210> 16

<211> 135

<212> PRT

<213> Aspergillus nidulans

<400> 16

Met	Arg	Phe	Ile	Val	Ser	Leu	Leu	Ala	Phe	Thr	Ala	Ala	Ala	Thr	Ala
1				5					10					15	

Thr	Ala	Leu	Pro	Ala	Ser	Ala	Ala	Lys	Asn	Ala	Lys	Leu	Ala	Thr	Ser
			20					25					30		

Ala	Ala	Phe	Ala	Lys	Gln	Ala	Glu	Gly	Thr	Thr	Cys	Asn	Val	Gly	Ser
		35					40					45			

Ile	Ala	Cys	Cys	Asn	Ser	Pro	Ala	Glu	Thr	Asn	Asn	Asp	Ser	Leu	Leu
	50					55					60				

Ser	Gly	Leu	Leu	Gly	Ala	Gly	Leu	Leu	Asn	Gly	Leu	Ser	Gly	Asn	Thr
65					70					75				80	

cct gat aga ccc aac ttg aaa aag cgc ctc ccg gcc tct gcc gca aag 192
Pro Asp Arg Pro Asn Leu Lys Lys Arg Leu Pro Ala Ser Ala Ala Lys
50 55 60

aac gcg aag ctg gcc acc tcg gcg gcc ttc gcc aag cag gct gaa ggc Asn Ala Lys Leu Ala Thr Ser Ala Ala Phe Ala Lys Gln Ala Glu Gly 65 70 75 80	240
acc acc tgc aat gtc ggc tcg atc gct tgc tgc aac tcc ccc gct gag Thr Thr Cys Asn Val Gly Ser Ile Ala Cys Cys Asn Ser Pro Ala Glu 85 90 95	288
acc aac aac gac agt ctg ttg agc ggt ctg ctc ggt gct ggc ctt ctc Thr Asn Asn Asp Ser Leu Leu Ser Gly Leu Leu Gly Ala Gly Leu Leu 100 105 110	336
aac ggg ctc tcg ggc aac act ggc agc gcc tgc gcc aag gcg agc ttg Asn Gly Leu Ser Gly Asn Thr Gly Ser Ala Cys Ala Lys Ala Ser Leu 115 120 125	384
att gac cag ctg ggt ctg ctc gct ctc gtc gac cac act gag gaa ggc Ile Asp Gln Leu Gly Leu Leu Ala Leu Val Asp His Thr Glu Glu Gly 130 135 140	432
ccc gtc tgc aag aac atc gtc gct tgc tgc cct gag gga acc acc aac Pro Val Cys Lys Asn Ile Val Ala Cys Cys Pro Glu Gly Thr Thr Asn 145 150 155 160	480
tgt gtt gcc gtc gac aac gct ggc gcc ggt acc aag gct gag ctg gtt Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu Leu Val 165 170 175	528
ccg cgt gga tcc atc gaa ggt cgt ggc ggc cgc atc ttt tac cca tac Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr Pro Tyr 180 185 190	576
gat gtt cct gac tat gcg ggc tat ccc tat gac gtc ccg gac tat gca Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala 195 200 205	624
gga tcc tat cca tat gac gtt cca gat tac gct gct cag tgc ggc cgc Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys Gly Arg 210 215 220	672
taa tag	678

<210> 18

<211> 224

<212> PRT

<213> Artificial Sequence

<220>

<223> Fusion protein

<400> 18

Met Lys Ile Thr Ala Val Ile Ala Leu Leu Phe Ser Leu Ala Ala Ala
 1 5 10 15

Ser Pro Ile Pro Val Ala Asp Pro Gly Val Val Ser Val Ser Lys Ser
 20 25 30

Tyr Ala Asp Phe Leu Arg Val Tyr Gln Ser Trp Asn Thr Phe Ala Asn
 35 40 45

Pro Asp Arg Pro Asn Leu Lys Lys Arg Leu Pro Ala Ser Ala Ala Lys
 50 55 60

Asn Ala Lys Leu Ala Thr Ser Ala Ala Phe Ala Lys Gln Ala Glu Gly
 65 70 75 80

Thr Thr Cys Asn Val Gly Ser Ile Ala Cys Cys Asn Ser Pro Ala Glu
 85 90 95

Thr Asn Asn Asp Ser Leu Leu Ser Gly Leu Leu Gly Ala Gly Leu Leu
 100 105 110

Asn Gly Leu Ser Gly Asn Thr Gly Ser Ala Cys Ala Lys Ala Ser Leu
 115 120 125

Ile Asp Gln Leu Gly Leu Leu Ala Leu Val Asp His Thr Glu Glu Gly
 130 135 140

Pro Val Cys Lys Asn Ile Val Ala Cys Cys Pro Glu Gly Thr Thr Asn
 145 150 155 160

Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu Leu Val
 165 170 175

Pro Arg Gly Ser Ile Glu Gly Arg Gly Gly Arg Ile Phe Tyr Pro Tyr
 180 185 190

Asp Val Pro Asp Tyr Ala Gly Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
 195 200 205

Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ala Gln Cys Gly Arg

210 215 220

 <210> 19
 <211> 131
 <212> PRT
 <213> Streptomyces coelicolor

 <400> 19
 Met Leu Lys Lys Ala Met Val Ala Ala Ala Ala Ala Ala Ser Val Ile
 1 5 10 15

 Gly Met Ser Ala Ala Ala Ala Pro Gln Ala Leu Ala Ile Gly Asp Asp
 20 25 30

 Asn Gly Pro Ala Val Ala Asn Gly Asn Gly Ala Glu Ser Ala Phe Gly
 35 40 45

 Asn Ser Ala Thr Lys Gly Asp Met Ser Pro Gln Leu Ser Leu Val Glu
 50 55 60

 Gly Thr Leu Asn Lys Pro Cys Leu Gly Val Glu Asp Val Asn Val Ala
 65 70 75 80

 Val Ile Asn Leu Val Pro Ile Gln Asp Ile Asn Val Leu Ala Asp Asp
 85 90 95

 Leu Asn Gln Gln Cys Ala Asp Asn Ser Thr Gln Ala Lys Arg Asp Gly
 100 105 110

 Ala Leu Ser His Val Leu Glu Asp Leu Ser Val Leu Ser Ala Asn Gly
 115 120 125

 Glu Gly Arg
 130

 <210> 20
 <211> 133
 <212> PRT

<213> Streptomyces coelicolor

<400> 20

Met	Ile	Lys	Lys	Val	Val	Ala	Tyr	Ala	Ala	Ile	Ala	Ala	Ser	Val	Met	1	5	10	15
Gly	Ala	Ser	Ala	Ala	Ala	Ala	Pro	Gln	Ala	Met	Ala	Ile	Gly	Asp	Asp	20	25	30	
Ser	Gly	Pro	Val	Ser	Ala	Asn	Gly	Asn	Gly	Ala	Ser	Gln	Tyr	Phe	Gly	35	40	45	
Asn	Ser	Met	Thr	Thr	Gly	Asn	Met	Ser	Pro	Gln	Met	Ala	Leu	Ile	Gln	50	55	60	
Gly	Ser	Phe	Asn	Lys	Pro	Cys	Ile	Ala	Val	Ser	Asp	Ile	Pro	Val	Ser	65	70	75	80
Val	Ile	Gly	Leu	Val	Pro	Ile	Gln	Asp	Leu	Asn	Val	Leu	Gly	Asp	Asp	85	90	95	
Met	Asn	Gln	Gln	Cys	Ala	Glu	Asn	Ser	Thr	Gln	Ala	Lys	Arg	Asp	Gly	100	105	110	
Ala	Leu	Ala	His	Leu	Leu	Glu	Asp	Val	Ser	Ile	Leu	Ser	Ser	Asn	Gly	115	120	125	
Glu	Gly	Gly	Lys	Gly	130														

<210> 21

<211> 112

<212> PRT

<213> Agaricus bisporus

<400> 21

Met	Ile	Ser	Arg	Val	Leu	Val	Ala	Ala	Leu	Val	Ala	Leu	Pro	Ala	Leu	1	5	10	15
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	----	----

Val Thr Ala Thr Pro Ala Pro Gly Lys Pro Lys Ala Ser Ser Gln Cys
 20 25 30

Asp Val Gly Glu Ile His Cys Cys Asp Thr Gln Gln Thr Pro Asp His
 35 40 45

Thr Ser Ala Ala Ala Ser Gly Leu Leu Gly Val Pro Ile Asn Leu Gly
 50 55 60

Ala Phe Leu Gly Phe Asp Cys Thr Pro Ile Ser Val Leu Gly Val Gly
 65 70 75 80

Gly Asn Asn Cys Ala Ala Gln Pro Val Cys Cys Thr Gly Asn Gln Phe
 85 90 95

Thr Ala Leu Ile Asn Ala Leu Asp Cys Ser Pro Val Asn Val Asn Leu
 100 105 110

<210> 22

<211> 119

<212> PRT

<213> Agaricus bisporus

<400> 22

Met Val Ser Thr Phe Ile Thr Val Ala Lys Thr Leu Leu Val Ala Leu
 1 5 10 15

Leu Phe Val Asn Ile Asn Ile Val Val Gly Thr Ala Thr Thr Gly Lys
 20 25 30

His Cys Ser Thr Gly Pro Ile Glu Cys Cys Lys Gln Val Met Asp Ser
 35 40 45

Lys Ser Pro Gln Ala Thr Glu Leu Leu Thr Lys Asn Gly Leu Gly Leu
 50 55 60

Gly Val Leu Ala Gly Val Lys Gly Leu Val Gly Ala Asn Cys Ser Pro
 65 70 75 80

Ile Thr Ala Ile Gly Ile Gly Ser Gly Ser Gln Cys Ser Gly Gln Thr
 85 90 95

Val Cys Cys Gln Asn Asn Asn Phe Asn Gly Val Val Ala Ile Gly Cys
 100 105 110

Thr Pro Ile Asn Ala Asn Val
 115

<210> 23

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 23
 cagctgggtc tgctcgctct cgctcgaccac ac

32

<210> 24

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 24
 gtgtgggtcga cgagagcgag cagacccagc tg

32

<210> 25

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 25

gaggggaacca ccaactgtgt tgccgtcgac

30

<210> 26

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 26

gtcgacggca acacagttgg tggttccctc

30

<210> 27

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 27

taataactcg agatgcgctt catcgtctct ctcc

34

<210> 28

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 28

taataaggat ccttactcag ccttggtacc ggc

33

<210> 29

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 29

ggtaccaagg ctgagctggt tccgcgtgga

30

<210> 30

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 30

tccacgcgga accagctcag ccttggtacc

30

<210> 31

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 31

attattccat ggctattagc ggccgcactg agcagc

36

<210> 32

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 32

gcctcaccta ttccactccc ggcctctgcc

30

<210> 33

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 33

ggcagaggcc gggagtggaa taggtgaggc

30

<210> 34

<211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 34

taatttctcg agatgaagat caccgctgtc attgcccttt tattctcac

49

<210> 35

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 35

gttgccgatc ctggtgtgct cccggcctct gcc

33

<210> 36

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 36

cacaccagga tcggcaactg gaataggtga ggc

33

<210> 37

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 37

aacttgaaaa agcgctccc ggcctctgcc

30

<210> 38

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 38

ggcagaggcc gggaggcgct ttttcaagtt gggtc

35

<210> 39

<211> 552

<212> DNA

<213> *Aspergillus nidulans*

<220>

<221> CDS

<222> (1) .. (288)

<220>

<221> CDS

<222> (508) .. (549)

<220>

<221> intron

<222> (456) .. (507)

<220>

<221> CDS

<222> (381) .. (455)

<220>

<221> Intron

<222> (289) .. (380)

<400> 39

atg	cgc	ttc	atc	gtc	tct	ctc	ctc	gcc	ttc	act	gcc	gcg	gcc	acc	gca	48
Met	Arg	Phe	Ile	Val	Ser	Leu	Leu	Ala	Phe	Thr	Ala	Ala	Ala	Thr	Ala	
1				5				10					15			

acc	gcc	ctc	ccg	gcc	tct	gcc	gca	aag	aac	gcg	aag	ctg	gcc	acc	tcg	96
Thr	Ala	Leu	Pro	Ala	Ser	Ala	Ala	Lys	Asn	Ala	Lys	Leu	Ala	Thr	Ser	
			20					25					30			

gcg	gcc	ttc	gcc	aag	cag	gct	gaa	ggc	acc	acc	tgc	aat	gtc	ggc	tcg	144
Ala	Ala	Phe	Ala	Lys	Gln	Ala	Glu	Gly	Thr	Thr	Cys	Asn	Val	Gly	Ser	

35	40	45	
atc gct tgc tgc aac tcc ccc gct gag acc aac aac gac agt ctg ttg			192
Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu			
50	55	60	
agc ggt ctg ctc ggt gct ggc ctt ctc aac ggg ctc tcg ggc aac act			240
Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr			
65	70	75	80
ggc agc gcc tgc gcc aag gcg agc ttg att gac cag ctg ggt ctg ctc			288
Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu			
85	90	95	
ggtagctgat cccactcag tcgctcccg agaggctgag ggaagacgag cgacggtcta			348
gaaatggtgt gctaatagat gcatgtgtgc ag ctc tcg tcg acc aca ctg agg			401
	Leu Ser Ser Thr Thr Leu Arg		
	100		
aag gcc ccg tct gca aga aca tcg tcg ctt gct gcc ctg agg gaa cca			449
Lys Ala Pro Ser Ala Arg Thr Ser Ser Leu Ala Ala Leu Arg Glu Pro			
105	110	115	
cca acg tacgtctttc agatctgcta caagtgaggc gatcaaaact aacatattcc ag			507
Pro Thr			
120			
tgt gtt gcc gtc gac aac gct ggc gcc ggt acc aag gct gag taa			552
Cys Val Ala Val Asp Asn Ala Gly Ala Gly Thr Lys Ala Glu			
125	130	135	

<210> 40

<211> 135

<212> PRT

<213> Aspergillus nidulans

<400> 40

Met Arg Phe Ile Val Ser Leu Leu Ala Phe Thr Ala Ala Ala Thr Ala
1 5 10 15

Thr Ala Leu Pro Ala Ser Ala Ala Lys Asn Ala Lys Leu Ala Thr Ser
20 25 30

Ala Ala Phe Ala Lys Gln Ala Glu Gly Thr Thr Cys Asn Val Gly Ser
35 40 45

Ile Ala Cys Cys Asn Ser Pro Ala Glu Thr Asn Asn Asp Ser Leu Leu
 50 55 60

Ser Gly Leu Leu Gly Ala Gly Leu Leu Asn Gly Leu Ser Gly Asn Thr
 65 70 75 80

Gly Ser Ala Cys Ala Lys Ala Ser Leu Ile Asp Gln Leu Gly Leu Leu
 85 90 95

Leu Ser Ser Thr Thr Leu Arg Lys Ala Pro Ser Ala Arg Thr Ser Ser
 100 105 110

Leu Ala Ala Leu Arg Glu Pro Pro Thr Cys Val Ala Val Asp Asn Ala
 115 120 125

Gly Ala Gly Thr Lys Ala Glu
 130 135

<210> 41

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer

<400> 41

taataaggat ccatgcgctt catcgtctct ctcc

34

<210> 42

<211> 129

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1) .. (126)

<400> 42
 atg gac tca atg gct aac tcc gtt tct tcc tcc tct gtc gtc aac gct 48
 Met Asp Ser Met Ala Asn Ser Val Ser Ser Ser Ser Val Val Asn Ala
 1 5 10 15

ggc aac aag cct gct gaa act ctt aac aag acc gtt aag aat tat acc 96
 Gly Asn Lys Pro Ala Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr
 20 25 30

ccc aag gtt cct tac atg tgt gtc att gca taa 129
 Pro Lys Val Pro Tyr Met Cys Val Ile Ala
 35 40

<210> 43

<211> 42

<212> PRT

<213> Schizosaccharomyces pombe

<400> 43

Met Asp Ser Met Ala Asn Ser Val Ser Ser Ser Ser Val Val Asn Ala
 1 5 10 15

Gly Asn Lys Pro Ala Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr
 20 25 30

Pro Lys Val Pro Tyr Met Cys Val Ile Ala
 35 40

<210> 44

<211> 27

<212> DNA

<213> Schizosaccharomyces pombe

<400> 44
 tataccccca aggttcctta catgtgt 27

<210> 45

<211> 135

<213> Schizosaccharomyces pombe

<221> CDS

$\langle 222 \rangle \quad (1) \dots (132)$

atg gac tcc att gca act aac act cat tct tca tcc att gtc aat gcc 48
Met Asp Ser Ile Ala Thr Asn Thr His Ser Ser Ser Ile Val Asn Ala
1 5 10 15

tac aac aac aat cct acc gat gtt gta aaa act caa aac att aaa aat 96
 Tyr Asn Asn Asn Pro Thr Asp Val Val Lys Thr Gln Asn Ile Lys Asn
 20 25 30

tat act cca aag gtt cct tat atg tgt gta att gct taa 135
Tyr Thr Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<211> 44

<213> Schizosaccharomyces pombe

Met Asp Ser Ile Ala Thr Asn Thr His Ser Ser Ser Ile Val Asn Ala
1 5 10 15

Tyr Asn Asn Asn Pro Thr Asp Val Val Lys Thr Gln Asn Ile Lys Asn
20 25 30

Tyr Thr Pro Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<211> 27

<213> Schizosaccharomyces pombe

<400> 47
tataactccaa aggttcctta tatgtgt

27

<210> 48

<211> 126

<212> DNA

<213> Schizosaccharomyces pombe

<220>

<221> CDS

<222> (1)..(123)

<400> 48
atg gac tca atg gct aac act gtt tct tcc tcc gtc gtt aac act ggc 48
Met Asp Ser Met Ala Asn Thr Val Ser Ser Ser Val Val Asn Thr Gly
1 5 10 15

aac aag cct tct gaa act ctt aac aag act gtt aag aat tat acc ccc 96
Asn Lys Pro Ser Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr Pro
20 25 30

aag gtt cct tac atg tgt gtc att gca taa 126
Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 49

<211> 41

<212> PRT

<213> Schizosaccharomyces pombe

<400> 49

Met Asp Ser Met Ala Asn Thr Val Ser Ser Ser Val Val Asn Thr Gly
1 5 10 15

Asn Lys Pro Ser Glu Thr Leu Asn Lys Thr Val Lys Asn Tyr Thr Pro
20 25 30

Lys Val Pro Tyr Met Cys Val Ile Ala
35 40

<210> 50

<211> 27

<212> DNA

<213> Schizosaccharomyces pombe

<400> 50

tataccccca aggttcctta catgtgt

27

<210> 51

<211> 9

<212> PRT

<213> Schizosaccharomyces pombe

<400> 51

Tyr Thr Pro Lys Val Pro Tyr Met Cys
1 5

<210> 52

<211> 586

<212> DNA

<213> Aspergillus nidulans

<220>

<221> Intron

<222> (471) .. (530)

<220>

<221> Intron

<222> (338) .. (389)

<400> 52
 atgaagttct ccattgctgc cgctgtcggt gctttcgccg cctccgtcgc ggccctccct 60
 cctgcccattg attcccagtt cgctggcaat ggtgttgga acaagggcaa cagcaacgtc 120
 aagttccctg tccccgaaaa cgtgaccgtc aagcaggcct ccgacaagtg cggtgaccag 180
 gccagctct cttgctgcaa caaggccacg tacgccggtg acaccacaac cgttgatgag 240
 ggtcttctgt ctggtgccct cagcggcctc atcggcgccg ggtctggtgc cgaaggctct 300
 ggtctcttcg atcagtgtc caagcttgat gttgctggc agttcttcga aaatcacttt 360
 cgtgatgcc caatgctaac aattaccagt cctcattggc atccaagatc ttgtcaacca 420
 gaagtgaag caaaacattg cctgctgcca gaactcccc tccagcgcgg tatgttccct 480
 tgttttacag cttattcact taaaccgatt aatctaaca cgctcacagg atggcaacct 540
 tattggtgtc ggtctccctt gcgttgccct tgggtccatc ctctaa 586

<210> 53

<211> 474

<212> DNA

<213> *Aspergillus nidulans*

<220>

<221> CDS

<222> (1) .. (471)

<400> 53
 atg aag ttc tcc att gct gcc gct gtc gtt gct ttc gcc gcc tcc gtc 48
 Met Lys Phe Ser Ile Ala Ala Ala Val Val Ala Phe Ala Ala Ser Val
 1 5 10 15
 gcg gcc ctc cct cct gcc cat gat tcc cag ttc gct ggc aat ggt gtt 96
 Ala Ala Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val
 20 25 30
 ggc aac aag ggc aac agc aac gtc aag ttc cct gtc ccc gaa aac gtg 144
 Gly Asn Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val
 35 40 45
 acc gtc aag cag gcc tcc gac aag tgc ggt gac cag gcc cag ctc tct 192

Thr	Val	Lys	Gln	Ala	Ser	Asp	Lys	Cys	Gly	Asp	Gln	Ala	Gln	Leu	Ser		
50						55					60						
tgc	tgc	aac	aag	gcc	acg	tac	gcc	ggg	gac	acc	aca	acc	gtt	gat	gag	240	
Cys	Cys	Asn	Lys	Ala	Thr	Tyr	Ala	Gly	Asp	Thr	Thr	Thr	Val	Asp	Glu		
65					70				75					80			
ggg	ctt	ctg	tct	ggg	gcc	ctc	agc	ggc	ctc	atc	ggc	gcc	ggg	tct	ggg	288	
Gly	Leu	Leu	Ser	Gly	Ala	Leu	Ser	Gly	Leu	Ile	Gly	Ala	Gly	Ser	Gly		
				85					90					95			
gcc	gaa	ggg	ctt	ggg	ctc	ttc	gat	cag	tgc	tcc	aag	ctt	gat	gtt	gct	336	
Ala	Glu	Gly	Leu	Gly	Leu	Phe	Asp	Gln	Cys	Ser	Lys	Leu	Asp	Val	Ala		
			100					105					110				
gtc	ctc	att	ggc	atc	caa	gat	ctt	gtc	aac	cag	aag	tgc	aag	caa	aac	384	
Val	Leu	Ile	Gly	Ile	Gln	Asp	Leu	Val	Asn	Gln	Lys	Cys	Lys	Gln	Asn		
		115					120					125					
att	gcc	tgc	tgc	cag	aac	tcc	ccc	tcc	agc	gcg	gat	ggc	aac	ctt	att	432	
Ile	Ala	Cys	Cys	Gln	Asn	Ser	Pro	Ser	Ser	Ala	Asp	Gly	Asn	Leu	Ile		
		130				135					140						
ggg	gtc	ggg	ctc	cct	tgc	gtt	gcc	ctt	ggc	tcc	atc	ctc	taa			474	
Gly	Val	Gly	Leu	Pro	Cys	Val	Ala	Leu	Gly	Ser	Ile	Leu					
145					150				155								

<210> 54

<211> 157

<212> PRT

<213> Aspergillus nidulans

<400> 54

Met	Lys	Phe	Ser	Ile	Ala	Ala	Ala	Val	Val	Ala	Phe	Ala	Ala	Ser	Val		
1				5				10						15			
Ala	Ala	Leu	Pro	Pro	Ala	His	Asp	Ser	Gln	Phe	Ala	Gly	Asn	Gly	Val		
			20					25					30				
Gly	Asn	Lys	Gly	Asn	Ser	Asn	Val	Lys	Phe	Pro	Val	Pro	Glu	Asn	Val		
		35					40					45					
Thr	Val	Lys	Gln	Ala	Ser	Asp	Lys	Cys	Gly	Asp	Gln	Ala	Gln	Leu	Ser		
50						55					60						
Cys	Cys	Asn	Lys	Ala	Thr	Tyr	Ala	Gly	Asp	Thr	Thr	Thr	Val	Asp	Glu		

65		70		75		80									
Gly	Leu	Leu	Ser	Gly	Ala	Leu	Ser	Gly	Leu	Ile	Gly	Ala	Gly	Ser	Gly
				85					90					95	
Ala	Glu	Gly	Leu	Gly	Leu	Phe	Asp	Gln	Cys	Ser	Lys	Leu	Asp	Val	Ala
			100					105					110		
Val	Leu	Ile	Gly	Ile	Gln	Asp	Leu	Val	Asn	Gln	Lys	Cys	Lys	Gln	Asn
		115					120					125			
Ile	Ala	Cys	Cys	Gln	Asn	Ser	Pro	Ser	Ser	Ala	Asp	Gly	Asn	Leu	Ile
	130					135					140				
Gly	Val	Gly	Leu	Pro	Cys	Val	Ala	Leu	Gly	Ser	Ile	Leu			
145					150					155					

<210> 55

<211> 420

<212> DNA

<213> *Aspergillus nidulans*

<220>

<221> CDS

<222> (1)..(417)

<400>	55	
ctc cct cct gcc cat gat tcc cag ttc gct ggc aat ggt gtt ggc aac		48
Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val Gly Asn		
1 5 10 15		
aag ggc aac agc aac gtc aag ttc cct gtc ccc gaa aac gtg acc gtc		96
Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val Thr Val		
20 25 30		
aag cag gcc tcc gac aag tgc ggt gac cag gcc cag ctc tct tgc tgc		144
Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser Cys Cys		
35 40 45		
aac aag gcc acg tac gcc ggt gac acc aca acc gtt gat gag ggt ctt		192
Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu Gly Leu		
50 55 60		

ctg tct ggt gcc ctc agc ggc ctc atc ggc gcc ggg tct ggt gcc gaa 240
 Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly Ala Glu
 65 70 75 80

ggt ctt ggt ctc ttc gat cag tgc tcc aag ctt gat gtt gct gtc ctc 288
 Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala Val Leu
 85 90 95

att ggc atc caa gat ctt gtc aac cag aag tgc aag caa aac att gcc 336
 Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn Ile Ala
 100 105 110

tgc tgc cag aac tcc ccc tcc agc gcg gat ggc aac ctt att ggt gtc 384
 Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile Gly Val
 115 120 125

ggt ctc cct tgc gtt gcc ctt ggc tcc atc ctc taa 420
 Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
 130 135

<210> 56

<211> 139

<212> PRT

<213> *Aspergillus nidulans*

<400> 56

Leu Pro Pro Ala His Asp Ser Gln Phe Ala Gly Asn Gly Val Gly Asn
 1 5 10 15

Lys Gly Asn Ser Asn Val Lys Phe Pro Val Pro Glu Asn Val Thr Val
 20 25 30

Lys Gln Ala Ser Asp Lys Cys Gly Asp Gln Ala Gln Leu Ser Cys Cys
 35 40 45

Asn Lys Ala Thr Tyr Ala Gly Asp Thr Thr Thr Val Asp Glu Gly Leu
 50 55 60

Leu Ser Gly Ala Leu Ser Gly Leu Ile Gly Ala Gly Ser Gly Ala Glu
 65 70 75 80

Gly Leu Gly Leu Phe Asp Gln Cys Ser Lys Leu Asp Val Ala Val Leu
 85 90 95

Ile Gly Ile Gln Asp Leu Val Asn Gln Lys Cys Lys Gln Asn Ile Ala
100 105 110

Cys Cys Gln Asn Ser Pro Ser Ser Ala Asp Gly Asn Leu Ile Gly Val
115 120 125

Gly Leu Pro Cys Val Ala Leu Gly Ser Ile Leu
130 135